

#3

SEQUENCE LISTING

<110> Stiles, Michael E. Verderas, John C. Van Belkum,
Marius J. Worobo, Randy W. Worobo, Rodney J.
McCormick, John K. McMullen, Lynn M. Leisner, Jorgen J.
Poon, Alison Franz, Charles MAP <120> Novel Bacteriocins,
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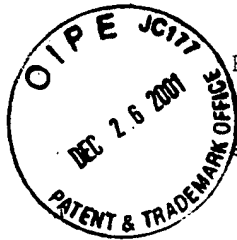
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<210> 16 <211> 227 <212> DNA <213> Divergicin structural gene;
<220> <221> CDS <222> (1)..(225) <223>

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 1 5 10 15

ggg gca aca ttt ttc tca aca cca caa caa gct tct gct gct gca ccg 96
 Gly Ala Thr Phe Phe Ser Thr Pro Gln Gln Ala Ser Ala Ala Ala Pro
 20 25 30

aaa att act caa aaa caa aaa aat tgt gtt aat gga caa tta ggt gga 144
 Lys Ile Thr Gln Lys Gln Lys Asn Cys Val Asn Gly Gln Leu Gly Gly
 35 40 45

atg ctt gct gga gct ttg ggt gga cct ggc gga gtt gtg tta ggt ggt 192
 Met Leu Ala Gly Ala Leu Gly Gly Pro Gly Gly Val Val Leu Gly Gly
 50 55 60

ata ggt ggt gca ata gca gga ggt tgt ttt aat ta 227
 Ile Gly Gly Ala Ile Ala Gly Gly Cys Phe Asn
 65 70 75

<210> 17 <211> 75 <212> PRT <213> Divergicin structural gene; <400>
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 1 5 10 15

Gly Ala Thr Phe Phe Ser Thr Pro Gln Gln Ala Ser Ala Ala Ala Pro
 20 25 30

Lys Ile Thr Gln Lys Gln Lys Asn Cys Val Asn Gly Gln Leu Gly Gly
 35 40 45

Met Leu Ala Gly Ala Leu Gly Gly Pro Gly Gly Val Val Leu Gly Gly
 50 55 60

Ile Gly Gly Ala Ile Ala Gly Gly Cys Phe Asn
 65 70 75

<210> 18 <211> 75 <212> PRT <213> Divergicin structural gene <400>
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 1 5 10 15

Gly Ala Thr Phe Phe Ser Thr Pro Gln Gln Ala Ser Ala Ala Ala Pro
 20 25 30

Lys Ile Thr Gln Lys Gln Lys Asn Cys Val Asn Gly Gln Leu Gly Gly
 35 40 45

Met Leu Ala Gly Ala Leu Gly Gly Pro Gly Gly Val Val Leu Gly Gly
 50 55 60

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 65 70 75

<210> 19 <211> 170 <212> DNA <213> divergicin immunity gene; <220>
 <221> CDS <222> (1)..(168) <223>

<400> 19
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 1 5 10 15
 ata att gtt ctt ctt gta ttt ttt tat aga agt tct ggt ttt tct tta 96
 Ile Ile Val Leu Leu Val Phe Phe Tyr Arg Ser Ser Gly Phe Ser Leu
 20 25 30
 aaa aat tta gtt tta gga agt tta ttt tat ttg ata gca att ggt ctt 144
 Lys Asn Leu Val Leu Gly Ser Leu Phe Tyr Leu Ile Ala Ile Gly Leu
 35 40 45
 ttt aat tat aaa aag ata aac aaa ta 170
 Phe Asn Tyr Lys Lys Ile Asn Lys
 50 55

<210> 20 <211> 56 <212> PRT <213> divergicin immunity gene; <400>
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 1 5 10 15

Ile Ile Val Leu Leu Val Phe Phe Tyr Arg Ser Ser Gly Phe Ser Leu
 20 25 30

Lys Asn Leu Val Leu Gly Ser Leu Phe Tyr Leu Ile Ala Ile Gly Leu
 35 40 45

Phe Asn Tyr Lys Lys Ile Asn Lys
 50 55

<210> 21 <211> 56 <212> PRT <213> Divergicin immunity gene <400>
 21

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 1 5 10 15

Ile Ile Val Leu Leu Val Phe Phe Tyr Arg Ser Ser Gly Phe Ser Leu
 20 25 30

Lys Asn Leu Val Leu Gly Ser Leu Phe Tyr Leu Ile Ala Ile Gly Leu
 35 40 45

Phe Asn Tyr Lys Lys Ile Asn Lys
50 55

<210> 22 <211> 124 <212> DNA <213> Divergicin signal peptide; <220>
<221> sig_peptide <222> (1)..(123) <223>

<220> <221> CDS <222> (1)..(123) <223>

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1 5 10 15
aat ttt aaa agg gtt ggt tat agt tgt ttg ttt atc tgg ggc aac att 96
Asn Phe Lys Arg Val Gly Tyr Ser Cys Leu Phe Ile Trp Gly Asn Ile
20 25 30
ttt ctc aac acc aca aca agc ttc tgc t 124
Phe Leu Asn Thr Thr Thr Ser Phe Cys
35 40

<210> 23 <211> 41 <212> PRT <213> Divergicin signal peptide; <400>
23

Ile Leu Val Ser Gln Thr Asn Leu Glu Val Gly Ile Tyr Glu Lys Thr
1 5 10 15

Asn Phe Lys Arg Val Gly Tyr Ser Cys Leu Phe Ile Trp Gly Asn Ile
20 25 30

Phe Leu Asn Thr Thr Thr Ser Phe Cys
35 40

<210> 24 <211> 41 <212> PRT <213> Divergicin signal sequence <400>
24

Ile Leu Val Ser Gln Thr Asn Leu Glu Val Gly Ile Tyr Glu Lys Thr
1 5 10 15

Asn Phe Lys Arg Val Gly Tyr Ser Cys Leu Phe Ile Trp Gly Asn Ile
20 25 30

Phe Leu Asn Thr Thr Thr Ser Phe Cys
35 40

<210> 25 <211> 675 <212> DNA <213> Brochocin-C; <400> 25
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aaaattatctt aaaggagggt gtttcatcat gcacaaggta aaaaaattaa acaatcaaga 120
gttacaacag atcgtggggag gttacagttc aaaagattgt ctaaaagata ttggtaaagg 180

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aattggtgct ggtacagtag ctggggcagc cggcgggtggc ctagctgcag gattaggtgc 240
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tggtggatta ttaggtaact aggaggttat atttatgaaa aaagaactat tgaataaaaa 360
tgaaatgagt agaattatcg gcggcaaaat aaattgggga aatgttggcg gttcttgtgt 420
tgagaggtgca gtaattggag gcgccctcgg tggactaggt ggagctggcg gaggttgcac 480
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atttcattcg ttgcattatg taacttttta ataaaaaaag atgtgtcttc aaaaaaaaaa 600
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ttctctaact agtac 675

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<210> 26 <211> 233 <212> DNA <213> Brochocin-C peptide A; <220>
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<220> <221> sig_peptide <222> (1)..(54) <223>

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<400> 26
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1 5 10 15

gga ggt tac agt tca aaa gat tgt cta aaa gat att ggt aaa gga att 96
Gly Gly Tyr Ser Ser Lys Asp Cys Leu Lys Asp Ile Gly Lys Gly Ile
20 25 30

ggt gct ggt aca gta gct ggg gca gcc ggc ggt ggc cta gct gca gga 144
Gly Ala Gly Thr Val Ala Gly Ala Ala Gly Gly Gly Leu Ala Ala Gly
35 40 45

tta ggt gct atc cca gga gca ttc gtt gga gca cat ttt gga gta atc 192
Leu Gly Ala Ile Pro Gly Ala Phe Val Gly Ala His Phe Gly Val Ile
50 55 60

ggc gga tct gcc gca tgc att ggt gga tta tta ggt aac ta 233
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65 70 75

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<210> 27 <211> 77 <212> PRT <213> Brochocin-C peptide A; <400> 27

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Met His Lys Val Lys Lys Leu Asn Asn Gln Glu Leu Gln Gln Ile Val
1 5 10 15

Gly Gly Tyr Ser Ser Lys Asp Cys Leu Lys Asp Ile Gly Lys Gly Ile
20 25 30

Gly Ala Gly Thr Val Ala Gly Ala Ala Gly Gly Gly Leu Ala Ala Gly
35 40 45

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Leu Gly Ala Ile Pro Gly Ala Phe Val Gly Ala His Phe Gly Val Ile
50 55 60

Gly Gly Ser Ala Ala Cys Ile Gly Gly Leu Leu Gly Asn
65 70 75

<210> 28 <211> 77 <212> PRT <213> Brochocin-C peptide A <400> 28

Met His Lys Val Lys Lys Leu Asn Asn Gln Glu Leu Gln Gln Ile Val
1 5 10 15

Gly Gly Tyr Ser Ser Lys Asp Cys Leu Lys Asp Ile Gly Lys Gly Ile
20 25 30

Gly Ala Gly Thr Val Ala Gly Ala Ala Gly Gly Gly Leu Ala Ala Gly
35 40 45

Leu Gly Ala Ile Pro Gly Ala Phe Val Gly Ala His Phe Gly Val Ile
50 55 60

Gly Gly Ser Ala Ala Cys Ile Gly Gly Leu Leu Gly Asn
65 70 75

<210> 29 <211> 182 <212> DNA <213> Brochocin-C peptide B; <220>
<221> CDS <222> (1)..(180) <223>

<220> <221> sig_peptide <222> (1)..(51) <223>

<400> 29

atg aaa aaa gaa cta ttg aat aaa aat gaa atg agt aga att atc ggc 48
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1 5 10 15

ggc aaa ata aat tgg gga aat gtt ggc ggt tct tgt gtt gga ggt gca 96
Gly Lys Ile Asn Trp Gly Asn Val Gly Gly Ser Cys Val Gly Gly Ala
20 25 30

gta att gga ggc gcc ctc ggt gga cta ggt gga gct ggc gga ggt tgc 144
Val Ile Gly Gly Ala Leu Gly Gly Leu Gly Gly Ala Gly Gly Gly Cys
35 40 45

att aca gga gct atc gga agt att tgg gat caa tgg ta 182
Ile Thr Gly Ala Ile Gly Ser Ile Trp Asp Gln Trp
50 55 60

<210> 30 <211> 60 <212> PRT <213> Brochocin-C peptide B; <400> 30

Met Lys Lys Glu Leu Leu Asn Lys Asn Glu Met Ser Arg Ile Ile Gly
1 5 10 15

Gly Lys Ile Asn Trp Gly Asn Val Gly Gly Ser Cys Val Gly Gly Ala
20 25 30

Val Ile Gly Gly Ala Leu Gly Gly Leu Gly Gly Ala Gly Gly Gly Cys
 35 40 45

Ile Thr Gly Ala Ile Gly Ser Ile Trp Asp Gln Trp
 50 55 60

<210> 31 <211> 60 <212> PRT <213> Brochocin-C peptide B <400> 31

Met Lys Lys Glu Leu Leu Asn Lys Asn Glu Met Ser Arg Ile Ile Gly
 1 5 10 15

Gly Lys Ile Asn Trp Gly Asn Val Gly Gly Ser Cys Val Gly Gly Ala
 20 25 30

Val Ile Gly Gly Ala Leu Gly Gly Leu Gly Gly Ala Gly Gly Gly Cys
 35 40 45

Ile Thr Gly Ala Ile Gly Ser Ile Trp Asp Gln Trp
 50 55 60

<210> 32 <211> 161 <212> DNA <213> Brochocin-C immunity peptide;
 <220> <221> CDS <222> (1)..(144) <223>

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 1 5 10 15

tgt aac ttt tta ata aaa aaa gat gtg tct tca aaa aaa aaa tta ttt 96
 Cys Asn Phe Leu Ile Lys Lys Asp Val Ser Ser Lys Lys Lys Leu Phe
 20 25 30

tta aca ggt tct att gct gtc ttt cta att atc tat gat ttt cta tgg 144
 Leu Thr Gly Ser Ile Ala Val Phe Leu Ile Ile Tyr Asp Phe Leu Trp
 35 40 45

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<210> 33 <211> 48 <212> PRT <213> Brochocin-C immunity peptide;
 <400> 33

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 1 5 10 15

Cys Asn Phe Leu Ile Lys Lys Asp Val Ser Ser Lys Lys Lys Leu Phe
 20 25 30

Leu Thr Gly Ser Ile Ala Val Phe Leu Ile Ile Tyr Asp Phe Leu Trp
 35 40 45

<210> 34 <211> 53 <212> PRT <213> Brochocin-C immunity peptide
<400> 34

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Cys Asn Phe Leu Ile Lys Lys Asp Val Ser Ser Lys Lys Lys Leu Phe
20 25 30

Leu Thr Gly Ser Ile Ala Val Phe Leu Ile Ile Tyr Asp Phe Leu Trp
35 40 45

Ile Ile Phe Ser Asn
50

<210> 35 <211> 2226 <212> DNA <213> Enterocin 900 operon; <400> 35
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aagctt 2226

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<210> 36 <211> 215 <212> DNA <213> Enterocin 900 peptide; <220>
 <221> sig_peptide <222> (1)..(54) <223>

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<210> 37 <211> 71 <212> PRT <213> Enterocin 900 peptide <400> 37

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20          25          30

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Asn Leu Ser Lys Gly Gly Ala Lys Cys Gly Ala Ala Ile Ala Gly Gly

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40

45

Leu Phe Gly Ile Pro Lys Gly Pro Leu Ala Trp Ala Ala Gly Leu Ala
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<210> 38 <211> 103 <212> PRT <213> Colicin V pre-peptide; <220>
 <221> disulfide-bond <222> (91)..(102) <223>

<220> <221> cleavage-site <222> (15)..(16) <223>

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 20 25 30

Val Ala Gly Gly Ile Gly Ala Ala Ala Gly Gly Val Ala Gly Gly Ala
 35 40 45

Ile Tyr Asp Tyr Ala Ser Thr His Lys Pro Asn Pro Ala Met Ser Pro
 50 55 60

Ser Gly Leu Gly Gly Thr Ile Lys Gln Lys Pro Glu Gly Ile Pro Ser
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Glu Ala Trp Asn Tyr Ala Ala Gly Arg Leu Cys Asn Trp Ser Pro Asn
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Asn Leu Ser Asp Val Cys Leu
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<210> 39 <211> 88 <212> PRT <213> Colicin V; <220> <221>
 disulfide-bond <222> (76)..(87) <223>

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Phe Val Ala Gly Gly Ile Gly Ala Ala Ala Gly Gly Val Ala Gly Gly
 20 25 30

Ala Ile Tyr Asp Tyr Ala Ser Thr His Lys Pro Asn Pro Ala Met Ser
 35 40 45

Pro Ser Gly Leu Gly Gly Thr Ile Lys Gln Lys Pro Glu Gly Ile Pro
50 55 60

Ser Glu Ala Trp Asn Tyr Ala Ala Gly Arg Leu Cys Asn Trp Ser Pro
65 70 75 80

Asn Asn Leu Ser Asp Val Cys Leu
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<210> 40 <211> 675 <212> DNA <213> carnobacteriocin BM1; <220>
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<220> <221> RBS <222> (290)..(293) <223>

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Met Lys Ser Val
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aaa gaa cta aat aaa aaa gaa atg caa caa att aat ggt gga gct atc 162
Lys Glu Leu Asn Lys Lys Glu Met Gln Gln Ile Asn Gly Gly Ala Ile
5 10 15 20

tct tat ggc aat ggt gtt tat tgt aac aaa gag aaa tgt tgg gta aac 210
Ser Tyr Gly Asn Gly Val Tyr Cys Asn Lys Glu Lys Cys Trp Val Asn
25 30 35

aag gca gaa aac aaa caa gct att act gga ata gtt atc ggt gga tgg 258
Lys Ala Glu Asn Lys Gln Ala Ile Thr Gly Ile Val Ile Gly Gly Trp
40 45 50

gct tct agt tta gca gga atg gga cat taaagaggta tctagtt atg ata 308
Ala Ser Ser Leu Ala Gly Met Gly His Met Ile
55 60

aaa gat gaa aaa ata aat aaa atc tat gct tta gtt aag agc gca ctt 356
Lys Asp Glu Lys Ile Asn Lys Ile Tyr Ala Leu Val Lys Ser Ala Leu
65 70 75

gat aat acg gat gtt aag aat gat aaa aaa ctt tct tta ctt ctt atg 404
Asp Asn Thr Asp Val Lys Asn Asp Lys Lys Leu Ser Leu Leu Leu Met
80 85 90 95

aga ata caa gaa aca tca att aat gga gaa cta ttt tac gat tat aaa 452
Arg Ile Gln Glu Thr Ser Ile Asn Gly Glu Leu Phe Tyr Asp Tyr Lys
100 105 110

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Lys Glu Leu Gln Pro Ala Ile Ser Met Tyr Ser Ile Gln His Asn Phe
115 120 125

cgg gtt cct gac gat cta gta aaa ctg tta gca tta gtt caa aca cct 548
 Arg Val Pro Asp Asp Leu Val Lys Leu Leu Ala Leu Val Gln Thr Pro
 130 135 140

aaa gct tgg tca ggg ttt taacttttagt tccagatgag ttaaaatcct 596
 Lys Ala Trp Ser Gly Phe
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<210> 41 <211> 61 <212> PRT <213> carnobacteriocin BM1; <400> 41

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Cys Trp Val Asn Lys Ala Glu Asn Lys Gln Ala Ile Thr Gly Ile Val
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Ile Gly Gly Trp Ala Ser Ser Leu Ala Gly Met Gly His
 50 55 60

<210> 42 <211> 88 <212> PRT <213> carnobacteriocin BM1; <400> 42

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 1 5 10 15

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 20 25 30

Leu Met Arg Ile Gln Glu Thr Ser Ile Asn Gly Glu Leu Phe Tyr Asp
 35 40 45

Tyr Lys Lys Glu Leu Gln Pro Ala Ile Ser Met Tyr Ser Ile Gln His
 50 55 60

Asn Phe Arg Val Pro Asp Asp Leu Val Lys Leu Leu Ala Leu Val Gln
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Thr Pro Lys Ala Trp Ser Gly Phe
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<210> 43 <211> 61 <212> PRT <213> carnobacteriocin BM1 <400> 43

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aat agc gta aaa gaa tta aac gtg aaa gaa atg aaa caa tta cac ggt Asn Ser Val Lys Glu Leu Asn Val Lys Glu Met Lys Gln Leu His Gly 5 10 15	286
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gta aaa gct aat gaa ttc tta tca aaa tta gtt gta caa tgt gct ggg Val Lys Ala Asn Glu Phe Leu Ser Lys Leu Val Val Gln Cys Ala Gly 90 95 100	580
aaa tta aca gct tca aac agt gag aac agt tat att gaa gta ata tca Lys Leu Thr Ala Ser Asn Ser Glu Asn Ser Tyr Ile Glu Val Ile Ser 105 110 115	628
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Lys Ile Asp Leu Gly Asn Glu Ser Leu Gln Asn Val Leu Glu Asn Tyr
190 195 200

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205 210 215 220

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225 230 235

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240 245 250

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Tyr Ile Lys Tyr Gly Tyr
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Gln Cys Ala Gly Lys Leu Thr Ala Ser Asn Ser Glu Asn Ser Tyr Ile
35 40 45

Glu Val Ile Ser Leu Leu Ser Arg Gly Ile Ser Ser Tyr Tyr Leu Ser
50 55 60

His Lys Arg Ile Ile Pro Ser Ser Met Leu Thr Ile Tyr Thr Gln Ile
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Gln Ala Asn Ala Ala Val Pro Ile Ile Leu Gly Arg Met Asn Ile Asp
35 40 45

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Gln Cys Ala Gly Lys Leu Thr Ala Ser Asn Ser Glu Asn Ser Tyr Ile
35 40 45

Glu Val Ile Ser Leu Leu Ser Arg Gly Ile Ser Ser Tyr Tyr Leu Ser
50 55 60

His Lys Arg Ile Ile Pro Ser Ser Met Leu Thr Ile Tyr Thr Gln Ile
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Gln Ala Asn Ala Ala Val Pro Ile Ile Leu Gly Arg Met Asn Ile Asp
 35 40 45

Ile Ser Thr Ala Ile Arg Lys Asp Gly Val Thr Leu Ser Glu Ile Gln
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